

REMARKS

Request for Reconsideration

Applicant has carefully considered the matters raised by the Examiner in the outstanding Final Office Action dated March 27, 2007 and the Examiner's comments in the Advisory Action dated May 30, 2007, but remains of the position that patentable subject matter is present. Applicant respectfully requests reconsideration of the Examiner's position based on the above amendments to the Claims and the following remarks.

Claims Status

Claims 1 and 3-7 are pending in this Application.

Claim 1 has been amended to add the limitations of Claim 8, and Claim 7 has been amended to add the limitations of Claim 9. Because of the amendments to Claims 1 and 7, Claims 8 and 9 have been canceled.

Rejection

In the Final Office Action, Claims 1, 3, 4 and 6-9 had been rejected as being unpatentable over a combination of Mills and Hoisington, while Claim 5 has been rejected as being unpatentable over a combination of Mills, Hoisington and Hintermann.

Mills had been cited to teach the basic apparatus of the present Invention, while Hoisington had been cited to teach decreasing the amount of ink to be jetted for high image recording speeds and increasing the amount of ink to be jetted for low image recording speeds. Hoisington had also been cited to teach varying the volume of the ink droplet. The Examiner reasoned that it would be obvious to one of ordinary skill in the art to vary the ink droplet volume in order to vary the amount of ink applied at the different recording speeds. Applicant respectfully disagrees with the Examiner's interpretation of Hoisington and submits that the claims, as presented herein, define over the teachings of Hoisington.

Turning first to Hoisington, Hoisington teaches that in order to control the volume or size of the ink droplet, the fire pulse voltage is varied. More specifically, Hoisington teaches that the voltage is directly proportional to the size of the ink droplet. Thus, the larger the voltage, the larger the ink droplet, and the smaller the voltage, the smaller the ink droplet. This is brought out in Paragraph 25 of Hoisington and is clearly illustrated in the Table below Paragraph 25 and in Table II below Paragraph 33 of Hoisington. As can be seen in these Tables, as the voltage decreases, the drop mass or drop volume also decreases. The Examiner will note that in Paragraph 30 of Hoisington, he equates drop volume and drop mass. Thus,

Applicant submits that Hoisington controls the drop volume through the voltage of the pulse.

Hoisington also teaches that different ink jets deliver different drop sizes at the same pulse. This fact is brought out in Paragraph 26 of Hoisington as well as in the two Tables previously noted. In other words, the same pulse at two different jets does not necessarily guarantee that the same volume of ink will be jetted from both jets.

Hoisington goes on to teach that the speed of the drop is dictated by the width of the pulse. The Examiner's attention is directed to Paragraph 28 of Hoisington which teaches that reducing the pulse width will increase the drop velocity.

Thus, Hoisington is teaching that with his pulses, he controls drop volume based on the size of the pulse and the speed of the drop based on the width or time of the pulse.

In Paragraph 35 of Hoisington, he teaches that the number of pulses during a printing cycle can be varied to enhance jet-to-jet uniformity or gray scale precision. Hoisington states in Paragraph 35 that a high resolution mode drop variable volume is accommodated jet-to-jet. He goes on to state that in low resolution mode, the number of firing pulses provided and/or enabled is reduced to provide lower print quality but faster printing. Thus, Paragraph 35 of Hoisington is teaching that, at high resolution mode, the number of pulses is increased and, at

low resolution mode, the number of pulses is decreased. Hoisington also states that drop variability at the high resolution mode is "accommodated". Hoisington does not state that either the voltage of the pulse or the pulse width is varied for either high resolution mode or low resolution mode. What Hoisington is teaching is that for high resolution mode and for low resolution mode, the number of pulses is varied. As the Examiner can appreciate, the number of pulses is not the voltage of the pulses or the width of the pulses.

Thus, Paragraph 35 of Hoisington can be summarized as teaching that for high resolution mode (slow printing speed) the number of pulses is increased while at low resolution mode (high speed printing speed) the number of pulses is decreased. There is no specific statement in Paragraph 35 of how drop variability volume is "accommodated". Hoisington does not state that the voltage is either increased or decreased for slow printing speeds.

Thus, Hoisington's teaching can be contrasted against the present Invention wherein Claims 1 and 7 have been amended to specify that the ink droplet size is varied according to the speed at which the recording takes place. In simple terms, the ink droplet size is made smaller for high speed recording and the ink droplet side is made larger for slow speed recording.

In the present Invention which uses an irradiation device to cure the ink, Applicant has found that decreasing the ink at a high recording speed allows the irradiation device enough time to cure the ink. Thus, even if the irradiation time for an ink droplet is short for high speed recording, the irradiation level is adequate to cure the small volume of ink which has been jetted onto the recording medium. Thus, the amount of irradiation and the size of the ink droplet are controlled such that a proper amount of irradiation is used for the amount of ink.

Since Hoisington does not irradiate his ink, he cannot appreciate the problem that has been solved by the present Invention, namely, controlling the amount of ink to allow for sufficient irradiation for curing the ink. Respectfully, since Hoisington is not directed to irradiating the ink, he cannot teach or suggest solving the problem which is solved by the present Invention, namely, coordinating the amount of irradiation with the amount of ink so as to be sure that the ink is properly irradiated and cured.

Respectfully, the secondary references of Mills and Hintermann do not add the missing element of teaching that the volume of the ink droplet is reduced for high speed printing and the size of the ink droplet can be increased for low speed printing such that a proper amount of irradiation is employed

for curing the ink. Respectfully, the claims as presented herein are patentable over each one of the cited references taken alone or in combination.

Conclusion

In view of the foregoing, it is respectfully submitted that the Application is in condition for allowance and such action is respectfully requested.

Should any fees or extensions of time be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit Account # 02-2275.

Respectfully submitted,

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